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The Thesis Submitted for the Degree of M. Sc

In the field of Watershed Management

**Spatial Prioritization of Flood Control Operations using
Analytical Hierarchical Processing and Fuzzy Logic Method in
Sistan and Baluchestan Malek Cia kooh Catchment**

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September 2022

Abstract:

Floods are one of the most common natural hazards in the world. Fuzzy logic methods and hierarchical analysis process are among the new scientific and engineering methods that can help managers and planners to select and determine priority watersheds for project implementation in selecting watersheds with priority for carrying out watershed management measures. watersheds, reduce the consequences of floods and reduce the costs and damages caused by it as much as possible. Malik Siyakoh watershed with an area of 15045 hectares and seven sub-basins is located in Sistan and Baluchistan province. In this research, the determination and prioritization of sub-basins with high flooding in order to study and implement watershed management operations in this watershed was done using two methods, fuzzy logic and hierarchical analysis process. In order to prioritize the implementation of flood control operations in the fuzzy logic method, first, using topographic and geological maps of the study area, and using ArcGIS software facilities and field visits, the boundaries of the basin were determined and sub-basins were identified. In the following, parameters related to flood production including physiographic, meteorological, vegetation, soil, geology, geomorphology and hydrology characteristics were calculated using the available data of this field. In the hierarchical analysis method, first the goal was determined, then the criteria and sub-criteria were determined, and based on those criteria, questionnaires were prepared and weighted by expert experts. Then, with the help of Expert Choice software, pairwise comparisons were made and the value and role of each criterion was determined. The results show that the accuracy of calculations is increased by combining GIS tools, fuzzy logic methods and hierarchical analysis process with traditional models and the watershed with higher flooding can be determined better.

Key words: Fuzzy Logic, Analytical Hierarchical Processing, Flood Control, Zahedan